

Claims:

1. An electroluminescent conjugated polymer comprising a side chain comprising a phosphorescent organometallic complex.
2. The electroluminescent conjugated polymer according to claim 1 further comprising another side chain comprising a charge transport moiety.
3. The electroluminescent conjugated polymer according to claim 1, wherein a backbone of said electroluminescent conjugated polymer comprises one or more repeating unit selected from the group consisting of mono-aromatic group, bicyclic-aromatic group, polycyclic-aromatic group, heterocyclic aromatic group, substituted aromatic group, and substituted heterocyclic aromatic group.
4. The electroluminescent conjugated polymer according to claim 1, wherein said organometallic complex is an Ir-, Pt-, Os- or Rb-complex, said organometallic complex comprises an element of O, N, S, P, Cl, Br, or C, and a heterocyclic ring, which coordinates Ir, Pt, Os or Rb, wherein said side chain further comprises a spacer which covalently bonds said organometallic complex to a backbone of the polymer.
5. The electroluminescent conjugated polymer according to claim 4, wherein said spacer is selected from the group consisting of alkylene, alkylene containing heteroatoms, substituted alkylene, substituted alkylene containing heteroatoms, an aromatic group, a heterocyclic aromatic group, a substituted aromatic group, and a substituted heterocyclic aromatic group.
6. The electroluminescent conjugated polymer according to claim 2, wherein said charge transport moiety is a hole transport moiety or an

- electron transport moiety, wherein said hole transport moiety is selected from the group consisting of a tertiary arylamine, a quarternary arylammonium salt, a tertiary heterocyclic aromatic amine, a quarternary heterocyclic aromatic ammonium, a substituted tertiary arylamine, a substituted quarternary arylammonium salt, a substituted heterocyclic aromatic amine, and a substituted quarternary heterocyclic aromatic ammonium; and said electron transport moiety comprises an oxadiazole, thiodiazole, triazole, pyridine, or pyrimidine group and is selected from the group consisting of a monoheterocyclic aromatic group, biheterocyclic aromatic group and polyheterocyclic aromatic group.
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7. The electroluminescent conjugated polymer according to claim 6, wherein said another side chain further comprises a divalent radical which covalently bonds said charge transport moiety to a backbone of said polymer, and said divalent radical is selected from the group consisting of alkylene, alkylene containing heteroatoms, substituted alkylene, substituted alkylene containing heteroatoms, an aromatic group, a heterocyclic aromatic group, a substituted aromatic group, and a substituted heterocyclic aromatic group.
 8. The electroluminescent conjugated polymer according to claim 1, which is a homopolymer.
 9. The electroluminescent conjugated polymer according to claim 1, which is a random copolymer, block copolymer or alternating copolymer.

10. The electroluminescent conjugated polymer according to claim 9, which comprises a non-conjugated sector among two or more conjugated sectors in a backbone of said copolymer.
11. The electroluminescent conjugated polymer according to claim 3,
5 wherein said backbone of said electroluminescent conjugated polymer comprises a repeating unit of fluorene or benzene.
12. The electroluminescent conjugated polymer according to claim 4, wherein said organometallic complex is an Ir-, or Pt-complex.
13. The electroluminescent conjugated polymer according to claim 4,
10 wherein said heterocyclic ring is 2-phenylpyridine, 2-benzo[4,5- α]thienylpyridine, (4,6-difluoro)phenylpyridine, 2-phenylbenzothiolate, acetylacetonate, or picolinate.
14. The electroluminescent conjugated polymer according to claim 4, wherein said backbone of said electroluminescent conjugated polymer
15 comprises two different repeating units, each of which comprises a side chain, each side chain comprising a phosphorescent organometallic complex, wherein said two phosphorescent organometallic complexes are different.
15. The electroluminescent conjugated polymer according to claim 6,
20 wherein said charge transport moiety is carbazole, triphenylamine, oxadiazole or triazole.
16. The electroluminescent conjugated polymer according to claim 7, wherein said divalent radical is a decylene.

17. The electroluminescent conjugated polymer according to claim 1,
wherein in a backbone of the polymer a repeating unit containing the
organometallic complex ranges from 0.05 to 100 mol%.
18. The electroluminescent conjugated polymer according to claim 17,
5 wherein the repeating unit containing the organometallic complex
ranges from 0.1 to 20 mol%.
19. The electroluminescent conjugated polymer according to claim 18,
wherein the repeating unit containing the organometallic complex
ranges from 0.5 to 10 mol%.
- 10 20. The electroluminescent conjugated polymer according to claim 1 further
comprising a crosslinkable or printable functional group.
21. An organic light emitting diode, which comprises: a positive electrode
formed on a substrate; a negative electrode; and a light emitting layer
disposed between said positive electrode and said negative electrode,
15 wherein said light emitting layer comprises the electroluminescent
conjugated polymer according to claim 1.
22. The organic light emitting diode as claimed in Claim 21 further
comprising an electron transporting layer formed between said light
emitting layer and said negative electrode.
- 20 23. The organic light emitting diode as claimed in Claim 21 further
comprising a hole injection layer formed between said positive electrode
and said light emitting layer.
24. The organic light emitting diode as claimed in Claim 22 further
comprising a hole transporting layer formed between said positive
25 electrode and said light emitting layer.

25. The organic light emitting diode as claimed in Claim 21 which is able to emit red light, yellow light, green light, blue light, white light or light with broad band containing multiple color peaks.